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MR. COOK'S REPORT ON THE EMPLOYMENT OF CONVICTS.

Your commissioner, appointed by the Governor, Secretary of State and Comptroller, under the "Act in relation to convict labor in State Prisons," passed April 9th, 1842, respectfully reports: That, finding the lands owned by the State were generally in detached parcels and often widely separated in the wilderness, that to travel over them with a dipping needle and, when a mine was discovered, excavate the ore and test its quality, would perhaps be a labor of years; has not attempted a discharge of this part of his duty required by the act. The act next requires the commissioner "if no such place can be found on the State lands, then to ascertain the most reasonable terms upon which the State can purchase a small tract of mineral land for such purposes properly located."

In conformity with this requisition I have examined the principal mining districts and manufactories of iron in the State. I have also examined one mine of zinc and lead.

As necessary to the understanding of many terms that must unavoidably be introduced into this report, and to enable your honourable body to form an opinion of the practibility of employing the convicts in mining and smelting, a brief outline of the process now generally used in the manufacture of wrought iron in the northern parts of our State, seems to be required.

The ores used are generally the magnetic oxide, found in primitive formations, and are of the richest and best variety known. Some of them work easier in the forge than others, that is, are more rapidly reduced; but such do not always produce the best quality of iron. The celebrated Arnold blue vein is easily worked and yields a soft tough iron, but not so well adapted for wheel tire, chains and many other uses where subject to much friction, or for machinery, axes and scythe backs, where firmness is requisite, as a harder iron. The Russian old sable, the most valuable imported into our country, is a hard tenacious iron. These ores are first raised from the mines by drilling and blasting. When the veins are narrow, much inconvenience is suffered by the workmen for want of room; and as soon as much depth is attained, the work is prosecuted by lamp light, which greatly increases the inconvenience as well as the danger from accidental explosion of powder. The labor of raising the ore is of course graduated by the depth at which it is obtained. With a qualified superintendent, laborers of very ordinary mental capacity can be employed in mining.

The next process consists in roasting the ore. Although great heat is not required in this, and it is generally formed in a rude manner, by piling the ore upon wood in the open air, a kiln erected for the purpose would be much more economical. In roasting the ores, the water, if any, with which they are combined, is driven off and the gasses dissipated. The principal object, however, with most ores, is to render them more friable, so that they may be crushed in the stamping mill with less difficulty. The ores are next placed in a trough, with strong iron gratings at the bottom, under a row of stampers with iron heads; the stampers are alternately elevated and then dropped upon the ore, by water or steam power. From the stamping trough, the ore falls upon an inclined plane of sheet iron, perforated with holes about the size of a pea. The ore not passing through these perforations is returned to the stamping trough, until reduced to the requisite fineness. From the inclined plane, under the stamping trough, the ore falls into a stream of water, which carries off the fine dust. From this stream the ore is shovelled into the separating sieves. The seperating sieves are about three feet long, two feet wide, and six or eight inches deep; with a bottom of sheet iron with perforations about the size of those before mentioned. These sieves are suspended over a vat of water, and are easily raised from, or immersed therein, at the pleasure of the workmen. A little of the purest ore, and consequently of the greatest specific gravity, is broken to about the size of a chesnut and first placed upon the bottom of the sieve, to the thickness of an inch or more, and called the bed. The sieve being raised from the vat by the apparatus to which it is suspended, several shovels full of the stamped ore is thrown upon the bed before mentioned. The sieve is then immersed in the water, and in so doing the apparatus to which it is attached is brought in contact with the cam or ratchet in motion, by which the sieve is shaken while so immersed. After being shaken about a minute, it is raised from the water, when it is found that the pure particles of ore, owing to their specific gravity, have found their way through the bed and perforations in the bottom of the sieve into the vat; while the particles of stone with which the ore was mixed, having less specific gravity, have gathered upon the surface above the bed. This stone is quickly removed and fresh ore shovelled into the sieve. A few days practice qualifies common laborers for this branch of the business also. The ore thus separated, is worth at least $5,00 per ton at the forge.

The Catalan forge is uniformly used in the production of wrought iron from the magnetic ores, in the northern part of our state. Some variety of opinions exist among gentlemen of science, in regard to the economy of using this forge. It is the same generally used in Russia and Sweden, in working the magnetic ores; and our bloomers insist that it produces the best quality of iron. The English ores cannot be worked in this forge, nor indeed any ores but those of the richest kind. Even these must be combined with a flux more fusible than the iron.

The Catalan forge is built somewhat similar to an ordinary fire-place—the difference being that the jambs are at right angles with the back, and have a little inclination from the hearth to the right and left. A plate of cast iron is placed in front against the jambs, with holes near the middle to draw off the slag. Above this lies a large plate of cast iron, about two inches in thickness, which forms an elevated hearth. This forge is of sufficient capacity to hold five or six bushels of coal. The tuyere for the blast generally enters near the bottom, on one side. In the Peru Company's works a tuyere enters on each side—which is considered an improvement. Cast iron pipes pass through the chimney, through which the air is blown and heated in some works to a red heat in the dark, before it enters the tuyeres. This is called the hot blast.

In commencing a loupe, some of the slag from the loupe just before removed is thrown into the fire. This slag, being melted, falls to the bottom of the fire, and below where the blast enters. Fresh coals being placed upon the fire, as soon as they burn with sufficient clearness a shovel full of the stamped ore is spread over the fire. Here it is suffered to remain a short time, until the oxygen which was combined with the iron is driven off by the heat. The oxygen, uniting with a portion of the carbon of the charcoal, passes off as carbonic acid gas. As soon as the ore is thus deoxidized, it is stirred into the fire, and falling upon the melted slag before mentioned, but being of greater specific gravity, slowly sinks through it; in doing which, it parts from the flux with which it is associated, and settles at the bottom in the condition of small scrap iron brought to a welding heat. More ore is then spread upon the fire, and in turn stirred into it. These manipulations, with the wetting down of the fire, and an occasional supply of coal, are continued for four hours in general, but in the Peru company's works only three hours, when a loupe of nearly two hundred pounds is formed. The quantity of slag, which has been steadily increasing with the size of the loupe, has covered and protected the latter from burning.

When the loupe is to be removed from the fire, the slag is first drawn off. The loupe, when brought out upon the ground, is much in the form of a large oblong loaf of bread, its structure somewhat loose and cavernous. When placed upon the anvil, its size is nearly equal to the full lift of the hammer. The blows of the hammer are then consequently light—a natural adaptation to the circumstances—for the loupe is not then in a condition to bear a heavy blow. As the loupe is reduced in size, its power of resistance is increased, and with it the force of the hammer. The loupe is drawn into a bar about three inches square, and this piece is called a bloom, and the iron, bloomed iron. If it is afterwards to be rolled, it is heated in a reverberatory furnace, (where light wood that is unsuitable for coal is used,) and passed through rollers which give the bars the shape required. Whatever their forms, the bars are denominated rolled iron. To produce a better quality of iron, the blooms should be hammered into bars, these bars cut in short pieces, welded together, and again hammered out. A repetition of the process still improves the quality. The best iron we import is said to be thus manufactured.

The hammers-man performs no labor while the loupe is forming, but gives directions to the firemen in managing the fire. One man can hammer the loupes into blooms for two or even three fires. Experience and mental capacity are more requisite in the hammers-man than in any other branch of this business. Apprentices are first made firemen before they are qualified for commencing as hammers-men.

The erroneous inference of Dr. Ure, that, in the Catalan forge, the ore was first reduced to cast iron, and then by adding more coal and continuing the heat, it lost its liquidity, and was converted into a loupe, has been very generally adopted by those who had no practical acquaintance with the subject. On the contrary, whenever by a mismanagement of the fire, or when experimenting with a newly discovered ore, the iron is accidentally melted, the loupe is lost. Cast iron cannot be puddled or converted into malleable iron at the bottom of a Catalan forge and below the blast.

If we can judge from European publications, we are in advance of Europe in the economy and facility with which we manufacture iron in this forge. A few years ago, five hours were required to form a loupe, and from five to seven hundred bushels of coal were consumed in obtaining a ton of iron. Now, at the Peru company's works, a loupe is formed in three hours, and a ton of iron is manufactured with the consumption of only 275 bushels of coal.

My first visit was to the extensive veins of iron owned by Messrs. McIntyre, Henderson and Robinson, in the town of Newcomb, Essex county. This locality is about forty miles nearly west of Port Henry, on lake Champlain. The Adirondack river, one of the branches of the Hudson, here falls about 100 feet in less than a mile, thus affording facilities for using the water several times in succession. In this fall it crosses a vein of rich ore about seven hundred feet wide. Near the bank of the river there is another vein, about three hundred feet wide, with an elevation of about five hundred feet. Here the removal of the ore could more appropriately be termed *quarrying* than *mining*, for as the workmen progressed into the side of the hill they would have a dry wall of iron in front, nearly five hundred feet high, without pumping or draining.

Two miles below this there is another vein, more than 500 feet wide, well elevated, and supposed to be two and a half miles in length. Several other extensive veins are found in the neighborhood, but enough has already been mentioned to supply the world for ages. With such facilities for obtaining the ores—with water power passing through them, and situated in the midst of a wilderness, where, by allowing the second growth of timber to vegetate, a sufficient supply of fuel could be obtained for an indefinite period—we may well question whether our globe furnishes another location possessing equal advantages for an extensive manufacture of iron with charcoal.

A small settlement has been made here, and a forge erected with two fires. The iron produced from these ores is of a very superior quality, combining both tenacity and firmness. But the want of a road through the forest, to lake Champlain, has thus far prevented much progress in the manufacture of iron at this place, and until this want is supplied it cannot be here prosecuted with advantage.

In addition to the mines and water powers, the proprietors also own between three and four hundred square miles of timber around them. I have as yet received no proposals for the sale of this tract. For a more full and accurate description of these mines, your honorable body is referred to the geological reports of Prof. Emmons, particularly that of 1840.

The mines of Clinton county, in the neighborhood

of Clintonville and Keeseville, are too well known to require a description in this report. Some opinion of the value of a good vein of iron ore, may be formed from the fact that the Arnold blue vein, which has only an average width of about five feet, has been rented for nearly six thousand dollars per annum, for ten yeers in succession; with a limitation as to the quantity of ore that might be removed. This mine has been worked to the depth of 250 feet. The water is removed by pumps worked by steam power. The ore from this mine is drawn from five to twenty miles, to the various forges where it is worked.

In this region the most valuable sites for the manufacture of iron are occupied with erections unsuitable for the employment of convicts, some of them quite expensive. I did not, therefore, obtain the terms of sale, as it would be impolitic to purchase property not available to the state. Besides, hard wood timber, the coal from which is used for the manufacture of iron, is not as abundant here as in several other sections I have examined.

After leaving the neighborhood of Clintonville, I next examined the Sailly and Averill vein, and the Skinner vein, which are parallel and contiguous to each other. Being separated but a few rods, they may very possibly unite at some depth below the surface. These mines are in Beekmantown, about 17 miles from Plattsburgh, and about 5 miles northwest from a water power on the Saranac, where the ore is worked. The ore is of the magnetic variety, and is very valuable. The iron is harder than the Arnold, very tenacious, and hammers smooth. The veins traverse a coarse reddish granite, and although the ore is not as rich as some others, it is easier worked than many, on account of the friable nature of the rock after roasting, with which it is associated; being then easily stamped and separated—an important consideration in all ores of this description. The Skinner vein is from ten to twenty feet in width. The Sailly and Averill vein is upwards of ninety feet wide, and has been traced about half a mile in length. As no bottom has ever been found to a vein of magnetic iron, we may, when the width of these veins is taken into the account, consider them inexhaustible by the ordinary industry of man. Although the mine has been worked several years, the excavation will not exceed ten or twelve feet in depth, and about one hundred feet in length. The veins are elevated, so as to admit of being easily drained to the depth of perhaps one hundred feet. No probable extent of working these mines, could therefore excavate them to a sufficient depth to require the use of pumps for a century to come. Next to the Adirondack mines, these are the best located of any I have visited, in regard to an abundant supply of fuel. A heavy growth of hard wood surrounds the mines on every side, extending to the north and west, beyond the reach of consumption for their use. The soil of the adjacent country is good, furnishing an abundant supply of provisions at a cheap rate.

The proprietors offer to dispose of these mines, with 200 acres of land, on which they are situated, and a valuable water privilege on the Saranac, for about $70,000. As all interested could not be consulted, this price was fixed as a probability. Perpaps better terms could be obtained by one authorized to purchase. I have no hesitation in saying, that for the manufacture of wrought iron, this is the best locality for such an establishment as seems to be contemplated by the act, that I have examined, with the exception of the Adirondack mines, and the only suitable one for the sale of which I have received proposals. A map of the mines and adjacent territory is herewith submitted.

There may be other mines in the state possessing equal, perhaps superior advantages for the manufacture of iron. But having travelled upwards of 1600 miles in visiting the prisons and the mining districts, consuming twice the time for which I am entitled to compensation by the act, I found myself unable to explore all the sections to which my attention was called.

It is said that the timber lands surrounding the Sailly, Averill and Skinner mines, can be purchased for from two to three dollars per acre. It is found, however, that coal can be purchased by a company at about the same price they must pay for its manufacture and delivery from the same lands, when owned by the company. The principal object therefore in owning the surrounding territory, would be to prevent the clearing of the lands, and thus secure the preservation of the second growth of timber. True we find in the neighborhood of Clintonville, where little or no attention has been paid to this subject, that notwithstanding the vast consumption of coal, it is obtained at about the same price as formerly. Still, the distance it is drawn to the works where it is used is yearly increasing, and must in time become a serious obstacle to the manufacture of iron in that region, unless measures are soon taken to secure a second growth of timber.

I have also examined several veins of iron ore in Hadley, Saratoga county, on the bank of the Hudson, belonging to T. J. Porter. The iron yielded by these ores is a very superior quality, and said by those who use it, to be similar to the old sable iron of Russia. An abundant water power is convenient to the mines, but the ore is obtained with considerable labor and a sufficient supply of fuel could only be secured, by ascending the river, cutting and seasoning the wood, and then floating it down the stream; as most of our hard wood will sink in the water when green.

I have likewise examined an extensive vein of iron ore in Salisbnry, Herkimer county, about seven miles northerly from Little-Falls. This vein has been recently opened, and is of convenient access. The ore at the surface appears to be occasionally combined with a small portion of sulphur, which is detrimental to its use in the forge, although it might prove a valuable ore for the furnace. Deeper excavations may perhaps show it to be useful in the forge.

The zinc and lead mine to which I have alluded, is called the Shawangunk mine and is located on the Shawangunk mountain, about two miles from the village of Wurtsboro' in Sullivan county. It has an elevation of about seven hundred feet above the Mamakating valley, through which passes the Delaware and Hudson canal at the base of the mountain. The ore is a mixture of blend and galena, or sulphuret of zinc and lead. The presence of zinc with lead is unfavorable to the reduction of the latter. To the want of experience in the proprietors, and to the unskilfulness of the English miners heretofore employed, the losses of the company are attributed. Since German miners have been employed, they have succeeded in separating the zinc from the lead, and reducing the latter in considerable quantities. The ore is found to average about three parts of zinc to two parts of lead.

A quantity of the separated zinc ore, said to be three hundred tons, is now upon the grounds. No attempt has, I believe, been made to reduce the zinc, which is effected by distillation, and is a process in which we have little or no experience in this country. Considerable improvements are said to have been recently made in Europe in the reduction of zinc, which if introduced here might prove profitable.

The mine is systematically opened; having an adit driven for draining it and withdrawing the ore; a shaft for ventilation, and several lateral galleries on the course of the vein. I am acquainted with no mine in our State that is so well opened and laid out for working as this. Buildings are erected at the foot of the mountain, about one mile from the mine, for stamping, separating and smelting the ore. They are of sufficient capacity to employ twenty or twenty-five men. Probably fifty men could now be employed in the mines, and the number might be increased as the excavations were extended. Its location upon the canal gives it great advantages in obtaining the requisite supply of fuel and provisions, and in transmitting the products of the mine to market.

I am told that the former proprietors of this mine have expended $150,000 in opening the mine, erecting the buildings and experimenting with the ores. The mine is now in a perfect condition for prosecuting the business, and the present proprietors offer to dispose of it, with about two hundred acres of land, buildings, steam engine and tools for $65,000, receiving six per cent stock, redeemable at the pleasure of the State. I herewith transmit a map of the premises and openings of the mine. A more detailed account of this mine may be found in the Geological Report of Prof. Mather, of 1840, page 251.

The act next provides that "It shall also be the duty of the commissioner to ascertain what would be the probable expense over and above the surplus earning of all the State prison convicts for two years, to remove to said tract not to exceed 500 of the prisonors confined in the prisons of this State, and the probable expense of building a prison for their safe keeping and accommodation."

As the disbursement of the prisons considerably exceeds the receipts the past year, and are like to do so hereafter under the present system, there are no *surplus earnings* by the convicts to be taken into the estimate. So much depends upon the number of the prisoners that shall be removed at a time, the time taken to erect the prisons, whether it shall be built by contract, or principally by the labor of convicts, and many other circumstances not necessary to enumerate, that it is difficult to form a satisfactory estimate of the expense, without a knowledge of the manner in which the building shall be conducted.

As there is a water communication from either prison to Plattsburgh, the expense of transporting the convicts to the locality on the Saranac would not be large. The channel of the Saranac is through a sandstone formation which furnishes the most durable and convenient material for building. This formation is here in strata from two inches to two feet in thickness. The stone is of a light color, firm, compact, and too hard for cutting; but breaks with straight edges for building. They can be raised in slabs of the largest extent, and broken so as to reach entirely through the thickest walls. At the forge where the Sailly, Averil and Skinner ores are worked, the channel of the Saranac in its formation is twenty or thirty feet in depth, and the earth is washed from the surface of the stone near the bank of the river. Where the edges of the strata are thus exposed, the stone can be raised with great ease and facility. Lime, I am told, can be here obtained in abundance at a moderate price.

The Auburn prison cost above half a million of dollars; but it is now found that a large portion of this expense might have been avoided. The absurdity of cutting a very hard stone, to obtain a handsome surface and make a beautiful structure of a prison where utility required strength only, seems not then to have been realized. The grates to the cell doors of the old part of that prison were of wrought iron plated with steel and tempered, costing as I am informed about eighty dollars each; while a cast iron door which could be furnished for one fourth of that sum, would be perfectly secure; especially where keepers or sentinels are always within hearing. Many other expenses there incurred are shown by experience to have been unnecessary.

To construct a prison with economy it would only be necessary to make a commencement with hired labor. As soon as say twenty-five cells were finished, so as to secure the convicts during the night, that number might be brought from a prison and employed upon the building. As more cells were added, convicts might be supplied to occupy them, and in this way the prison would be mostly the product of their own labor. Standing upon a rock, the heavy expenses incurred at Auburn in sinking foundations for their buildings and yard wall, would be entirely saved; and the level sandstone floor would be perfectly free from damp exhalations. In this way from the best data I have been able to obtain, a prison could probably be erected on the Saranac, of sufficient capacity for 500 convicts, at an expense to the State of less than $100,000.

If the convicts are to be employed in the manufacture of iron, the business should be commenced with a few men, and their number gradually increased, as they became acquainted with the business, and as erections are made to employ and accommodate them. It would probably require three or four years, if strict economy be consulted, before the convicts could be instructed in the business, and sufficient prisons, buildings and machinery could be erected by their labor to confine and employ 500 men.

It should be borne in mind that the mine is situated about five miles from the water power on the Saranac, and that if this site should be selected, a prison would be required at the mines of sufficient capacity to hold the miners, and a wall around the mouth of the mine. There is upon the ground a large quantity of granite which has been removed from the top of the vein in opening the mine. Much more would be removed in preparing the mine for a systematic business, perhaps enough for the purposes required. There is a small water power at the mine where the ore is now stamped and separated. But there is not a sufficient supply of water to stamp the ore for a large establishment. Five miles is less than the average distance which the ores of Clinton county are drawn from the mines to the water power where they are worked. The Adirondack mines are the only ones with which I am acquainted, where the water power and ore could be both enclosed within the same yard.

It occured to me while pursuing these investigations, that the heat escaping from the fire of a forge, where six or seven bushels of coal are kept in rapid combustion, might perhaps be made to generate sufficient steam to blow the fire and hammer the iron into blooms. It requires less than two and a half horse power to blow each fire, and four or five horse power are put in requisition for a short time while hammering. I have since obtained the opinions of scientific steam engine builders, who are accquainted with the manufacture of iron, and who suppose that the heat escaping from the forge would be sufficient for the purpose contemplated, and quite as probably be in excess as otherwise. If, however, it should be found necessary to add a small quantity of fuel while hammering, it might still be less expensive than the transportation of the ore to the water power. Many other conveniences would generally attend the working of

the ore upon the ground where it is raised. In this locality, the coal would be much easier obtained at the mine than at the water power. Indeed the most of it would be drawn from lands surrounding the mine, much from beyond it. The experiment of thus using the heat escaping from the forge, might be tried upon one fire, without incurring a probable loss in case of failure, of more than $1000; while, if successful, it would be of vast benefit in the manufacture of iron. Prudence would seem to require a trial of the experiment before erecting the buildings.

Rolling and slitting mills, and shops for hammering the iron into bars from the bloom, would still be necessary at the water power. But as it requires 2¼ tons of ore and 275 bushels of coal, with the best management, to manufacture a ton of bloomed iron, it will be seen that about four-fifths of the freight from the mine to the water power would be saved, in case the ore could be reduced at the mine.

From Mr. J. B. Bailey, the intelligent and experienced superintendent of the Peru company's works at Clintonville, I have obtained, among much other useful information on this subject, estimates of the expense of erections for this business as follows: The cost of a fire proof forge (no wood being used in its structure) of sufficient capacity for twenty fires, with the necessary blowing and hammering apparatus, all fixtures and tools for the workmen, on a site possessing medium conveniences, about $30,000. The cost of a separating house with all necessary fixtures, of sufficient extent to separate ore for twenty fires, about $4,500. These estimates are made on the supposition that the work would be done by contract, without the employment of convict labor in their construction. If the convicts are to be employed in the manufacture of iron, half a dozen fires would be sufficient in the commencement. The building should be so located that its length could be extended and the number of fires increased as required.

The act referred to, finally requires the commissioner to report "generally on the expediency of employing said convicts in such operations of mining and smelting." Few truths are better established by experience, than the fact, that a government can never, *under the same circumstances*, successfully compete with individuals in any branch of manufacture. But in the case before us, the circumstances are widely different, between the State and individuals. Instead of being obliged to pay the wages given by individuals, the State, of necessity, holds in confinement about 1400 convicts, for whose food and clothing it costs at Auburn about twelve cents, and at Sing-Sing about thirteen cents per day. The rations are furnished at the former place for 4¼ cents, and at the latter for 5⅞ cents per day—the addition is the cost of clothing. Hence we have heretofore found, that although a majority of these convicts were contracted to mechanics and manufactures, at an average of about 34 cents per diem, the State has realized a surplus from their earnings after defraying the expenses incidental to the prisons.

Among the various plans for a change in the employment of the convicts, some have insisted that they should be confined to mining alone. But my examinations lead to the conviction, that there is no mine where a market could be obtained for the ore that can be raised by one hundred men, independent of the difficulty of employing half that number in one of the narrow veins in the neighborhood where there are the greatest number of forges in operation, and where, consequently, a market would be expected for the ores. The mines, like the forges, are scattered over a large extent of country. The State could ill afford to establish prisons at the several veins, in order to supply the different forges with ore.

Others propose to employ the convicts in the blast furnace, in the production of pig metal merely. But here again the same difficulty occurs. The blast furnace employs but a few men, and it is very questionable whether any site could be found in our state, where one hundred could be advantageously employed in this business. In the manufacture of wrought iron, more labor is bestowed upon the material and consequently a greater proportionate number of workmen are required. In Wales, where the ore is first reduced to pig metal, and then *balled or puddled* for the production of wrought iron, as many as five thousand men are sometimes employed in a single establishment.

Before visiting the prisons, I had doubts whether the convicts could be made to exercise the care and attention requisite in this business, while forming the loupe. But at Auburn, especially, the convicts engage in their labors with apparent good will and energy, exhibiting more emulation in their different pursuits, than I have ever seen manifested in a shop of free laborers. My observations were corroborated by the testimony of the keeper and contractors. They agreed in the declaration, that there was not only much exertion to excel in skill, but that some of them would carry their efforts to do so, in the quantity of work they should perform, beyond their ability, and produce sickness. That although some were indolent and required urging, they were obliged to limit the labors of others to preserve their health. The contractors generally say, that the convicts perform as much labor in prison as they would perform in the same number of hours if "outside" and hired for the same business. My own observation would lead me to think they perform more work in prison than they would do under hire at liberty. We are not, however, to infer, that they all possess the skill and capacity that would secure them employment as journeymen at large; I speak of the men as they are with their various qualifications.

These results may in part originate in the condition of the convict in prison. There, industry and skill are the only means he possesses for securing the good opinions of those who govern him; and they may, in great part, be attributed to the discipline and management of the convicts, which are here conducted with skill, humanity and firmness. Arts requiring the exercise of more skill and attention than the manufacture of iron, are pursued in the prisons. The contractors at both, assure me that the convicts can be made to do any kind of work in the prisons, that they could do if at liberty.

I have no doubt but the convicts can be employed in the manufacture of wrought iron, in all its various branches, from the rising of the ore to the production of the best qualities. And I am convinced from the following reasons, that such employment would be far more advantageous to the state than the system at present pursued. Iron being an article of prime necessity, its consumption is less reduced by financial embarrassments, than perhaps any other article of manufacture. Its substitution for wood in machinery, mechanical tools and implements of agriculture, with the almost daily introduction of new arts and new machinery, to which its use is indispensable, all tend to produce a continually increasing demand for the article. At the present time, when almost every other branch of industry is depressed, the manufacture of iron is prosperous and profitable. Where the inexhaustible magnetic ores are used, the quantity which may be annually produced by a given number workmen, admits of mathematical calculation; and iron, not like agricultural products, subject to injury by the variableness of our climate, or the depredations of insects. The sale of iron may be sometimes subject to partial depressions; but it never *fails* of a market, like articles of mere convenience or luxury; nor does it ever vary in price, as much as agricultural products. The consumption of iron is so great, that the addition of a few hundreds or even thousands of men, in the production of this article, could produce no sensible effect upon the market. Indeed, we cannot suppose that our market will be impaired until we can supply it.

In the manufacture of iron the business is prosecuted night and day, by changing hands—the fires furnishing the requisite light. In the present system of employing the convicts, they labor only by daylight, about one-third of the time in the winter, while they are in danger of being overworked in the long days of summer. The best data however for forming a correct opinion of the advantages that may be derived by the state in thus employing convicts, will be furnished by ascertaining the wages received by those engaged in the business, (even at the present low rate,) together with profits obtained by the manufacturers. I give the wages paid at the Peru Company's works, which are the most extensive of the kind in the state.

The average wages now paid at the works before mentioned, are as follows:

Common laborers, per day, $0 80. Workmen separating ore, $0 90. Firemen, $1,60. Hammersmen, $2 00. The hammersmen and firemen earn these wages in making bloom iron for $8 00, and bar iron for $11 00 per ton.

After all the allowance for want of skill in the convicts, which the most extravagant can claim; even so far as to put all their wages as low as 80 cents per day, (the price there paid to common laborers,) the State would then realize in this business, more than twice the amount now received for their labor, although iron should bring in market no more than its present cost.

But, by selecting convicts senteneed for long periods for firemen and hammersmen, and using those confined for short terms as miners, separaters and common laborers, their earnings on an average may be made closely to approximate those under hire. When, however, the profits on the manufacture of iron are added to this estimate, the inducements to employ the convicts in this business are found to be still greater. The cost of a ton of bar iron at these works is thus estimated:

Two and a half tons of separated ore at $5 00 per ton,	$12 50
For charcoal,	17 00
Wages of workmen,	11 00
Add $1 50 for interest on investment, and we have $42.00 as the cost of a ton of iron.	$40 50

American rolled iron is now selling in the New-York market at from $70 to $80 per ton. Some iron is manufactured at the Peru Company's works which brings $100 per ton. To make such iron is of cour e more expensive than the preceding estimate. We have then this result: that after paying the wages above mentioned, and transportation, the manufacturers at present receive a profit of about 70 per cent. Under the present system the State cannot superintend the details of all the various trades and manufactures carried on in their prisons; but is compelled to contract away the labor of the convicts to individuals in different trades. The profits of their earning are principally secured by the contractors.

At the Sing-Sing prison the surplus earnings of the convicts in 1836 was $23,559 19, and in 1837, $17,760 07; while the past year their earnings do not defray the expenses of the prison. The agent attributes this great difference principally to the sale of stone cut by the convicts in the years when such profits were realized. The sale of stone, he says, was made by the agent for the State, without the intervention of the "middle man" to absorb the profits. Now, when "owing to the times" no sale of stone can be made, the only reliance of the agent for the support of the prison is the wages paid for convicts by contractors. For those employed as coopers he now obtains but 20 cents per day.

In the iron business, there is less necessity for the intervention of contractors between the State and the purchaser, than in the cutting of stone after drawings or models for particular buildings. The form of iron is simple; it requires no packing, nor is it liable to injury in transportation. All are its purchasers, and its market is almost every where. Its sale can always be effected by the agent of the prison without difficulty. The State would thus realize the full earnings of the convicts, and the profits on the manufacture; which, from the data before given, would exceed four times their present earnings.

The State, like companies in general, would be under the necessity of purchasing its coal delivered at the works. This cannot be produced by convict labor. So under the present system: the staves, lumber, leather iron, &c., which the convicts now use, are the products of voluntary labor.

A majority of the contracts for convict labor expire during the present year. It is the uniform opinion of the officers and contractors at both prisons, that the contracts cannot be renewed on as good terms for the State as heretofore. The gentlemen who have the contract for coopers, at Auburn, offer a handsome bonus to be released from their engagements. The salutary and wide-spread reformation from intemperance has so ruined the market for whiskey barrels, that the sales are said to have fallen off 90 per cent. With large quantities on hand, and no prospect of a market, it is doubted whether this contract can be relet on any terms. The provisions of the law of 1842, which prohibit the employment of the convicts at trades they had not before learned, unless it be in the manufacture of articles principally imported, seem to have been faithfully observed at Auburn. They have consequently at that place about 90 convicts who have little or no employment; and that number is continually increasing by new convictions. The agent is negotiating for their employ in the manufacture of hardware, in which he hopes to obtain 50 cents per day for their labor. If he fails in this, large numbers of the convicts will soon be idle, unless employed in mining.

Gentlemen of intelligence residing near the prisons, who have heretofore been familiar with their internal economy, are decidedly of opinion that after the expiration of the existing contracts for the labor of the convicts, the prisons will become an increasing burden upon the State, if the present system is continued. Of the correctness of this opinion I have no doubt. The well settled and self-evident principles of political economy will then demand the contemplated change. But a revival of that particular system, which requires the State to embark only in such enterprises as will be certainly ruinous to its finances, would forbid it. It is urged by some that the employment of the convicts in the manufacture of iron is equally objectionable to the present system, so far as it regards the complaint of their being placed in competition with the mechanics of our country. But is this objection well founded? The mechanics allege, (and with truth,) that they are abundantly able to supply all the demands of the country for their wares; and that the employment of the convicts in the same pursuits must necessarily throw a proportionate number of mechanics out of the business in which they have been instructed, and have also invested capital. It is not so with the manufacturers of iron. No exertions of theirs will, in all probability, prevent the importation of iron for a long time to come. The convicts, therefore, would in this business be put in competition with the manufacturers of iron in Europe.

In addition to the production of iron, the business of wire drawing, and the manufacture of many other articles which are principally imported, would afford employment to such of the convicts as are too feeble or otherwise incapable of being engaged in the more laborious branches. Such manufactures can be prosecuted most advantageously on the spot where the iron can be procured of the requisite qualities, and then made to approximate the necessary forms without allowing it to cool. The manufacture of iron is one of the oldest arts of man. It is placed by the experience of ages, beyond the reach of conjecture, theory or doubt. A reward for the labor bestowed upon it is probably more certain than in any other branch of human industry. Humanity forbids the solitary confinement of the convicts in idleness, while the financial interests of the State require their employment in the most profitable manner. I have no doubt the course now indicated will comply with both requirements, and at the same time quiet an excitement that has long agitated the State.

All of which is respectfully submitted.

RANSOM COOK.

KNOWLEDGE FOR THE PEOPLE.

BY JOHN TIMBS.

MECHANICS.

Why does a young quadruped walk much sooner than a child?

Because a body is tottering in proportion to its great altitude and narrow base. Now, the child has this latter, and learns to walk but slowly, because of the difficulty, perhaps in ten or twelve months, while the young of quadrupeds, having a broad supporting base, are able to stand, and even to move about almost immediately: but it is the noble prerogative of man to be able to support his towering figure with great firmness, on a very narrow base, and under constant change of attitude.—*Arnott.*

Why do certain structures remain secure, although they have lost their perpendicularity?

Because the line of their centre of gravity remains within the base. The famous tower of Pisa was built intentionally inclining, to frighten and surprise the people; it is 130 feet high, and overhangs its base 16 feet. At Bologna are two celebrated leaning towers, one of which, the Asinelli, is 350 feet high, and 3¼ feet out of the perpendicular. The other, Garisenda, is about 130 feet in height, and inclines 8 feet from the perpendicular. Montfaucon, the celebrated antiquary, attributes the leaning of these towers to the sinking of the earth. He says, it appears, upon examination, that when the Garisenda tower bowed, a great part of it went to ruin, because the ground that the inclined side stood on was not so firm as the other, which may be said of all other towers that lean so; for besides these two here mentioned, the tower for the bells of St. Mary Zobenica, at Venice, leans considerably to one side. So also at Ravenna, I took notice of another stooping tower, occasioned by the ground on that side giving way a little. In the way from Ferrara to Venice, where the soil is marshy, we see a structure of great antiquity leaning to one side. When the whole structure of the Garisenda stooped, much of it fell, as appears by the top.

The monument near London Bridge, inclines so much that timid people sometimes doubt its stability, and some years since its fall was a point of discussion. Salisbury, and some other cathedral spires or towers have lost something of their perpendicularity; Chesterfield, in Derbyshire, is proverbial for its zig-zag or wry spire.

The monument is of the Doric order, and arises from the pavement to the height of 202 feet, containing within its shaft a spiral stair of black marble of 345 steps; the plinth is 21 feet square. It was begun in 1571, but was not completed till 1577; stone being scarce, and the restoration of London and its cathedral swallowing up the produce of the quarries. Mr. Elmes, in his life of Sir Christopher Wren, the architect, tells us that the monument was at first used by the members of the Royal Society for astronomical experiments, but was abandoned on account of its vibrations being too great for the nicety required in their observations. This occasioned a report that it was unsafe; but its scientific construction may bid defionce to the attacks of all but earthquakes for centuries.

Why have the "simple machines," as the lever, wheel and axle, plane, wedge, screw, and pulley, been long called the "mechanic powers?"

Because they are first used to raise great weights or overcome great resistance. Hence the common error in supposing that they generate force, or have a sort of innate power for saving labor; whereas, neither simple mechanics nor mechanic powers save labor, in the strict meaning of the phrase.

Why then are these machines advantageous?

Because they allow a small force to take its requisite time to produce its magnitude of effect. Thus, one man's effort or any small power which is always at command, by working proportionally longer, will answer the purpose of the sudden efforts of many men, even of hundreds or thousands, whom it might be most inconvenient and expensive, or even impossible to bring together.

Why are there so many schemes for perpetual motions, and new mechanical engines of power?

Because the projectors do not understand the truth, that no form or combination of machinery ever did or can increase, in the slightest degree, the quantity of power applied. Hence the futility of supposing that a lever, or great pendulum, or spring, or heavy fly-wheel, &c. can ever exert more force than has passed into it from some source of motion.—*Arnott.*

Why is a beam or rod of any kind, resting at one part on a prop or axis, which becomes its centre of motion, called a lever?

Because such a contrivance was first employed to lift (*levare*, Latin) weights.

The lever, in mechanics, compensates power by space, and what is lost in power is gained in time. If the lever be 17 feet long, and the pivot or fulcrum be a foot from one end, an ounce placed on the other end will balance a pound placed on the near end. If, instead of an ounce, we place upon the long end the short end of a second beam or lever, supported by a fulcrum one foot from it, and then place the long end of this second lever upon the long end of a third lever, whose fulcrum is one foot from it; and if we put upon the end of this third lever's long arm an ounce weight, that ounce will move upwards a pound on the second lever's long arm; and this moving upwards, will cause the short end to force downwards 16 pounds at the long end of the first lever, which will make the short end of the first lever move upwards, although 256 pounds be laid upon it. The same effect continuing, a pound on the long end of the third lever, will move up a ton and three-quarters at the short end of the first lever, so that the touch of a child's finger will move as much as two horses can draw.—*Notes in Science.*

Why did Archimedes reasonably enough say, "Give me a lever long enough, and a prop strong enough, and with my own weight I will move the world?"

Because there is no limit to the difference of intensity of forces, which may be placed in opposition to each other by the lever, except the length and strength of the material of which the levers must be formed. But he would have required to move with the velocity of a cannon ball for millions of ages, to alter the position of the earth by the small part of an inch. This feat of Archimedes is, in mathematical truth, performed by every man who leaps from the ground, for he kicks the earth away when he rises, and attracts it again when he falls back.—*Arnott.*

Why is a finger caught near the hinge of a shutting door so much injured?

Because the centre of action of the door moves through a space comparatively great, and acts with a great lever-advantage on a resistance placed near the fulcrum of the lever where there is little motion. Children pinching their fingers in this way, or in the hinge of the fire-tongs, where there in a similar action, wonder why the bite is so keen.

Why may a boy, who cannot exert a direct force of 50lbs., by means of a claw-hammer, extract a nail, to which half a ton might be suspended?

Because this hand, perhaps, moves through eight inches, to make the nail rise one quarter of an inch. The claw-hammer also proves, that it is of no consequence whether the lever be straight or crooked, provided it produces the required difference of velocity between power and resistance. The part of the hammer resting on the plank, is the fulcrum, or prop.

POOR CHINA.

The English are holding a robber's jubilee for having grabbed a lot of land and money from China. They took (says the last mail) another big city, killed a parcel of men-women, and some real men. There was an old Tartar general there, who sooner than surrender, set fire to his house, then sat down in his arm chair, and died like a hero—the only one 'twould seem in China. As the result of this and other victories, the Chinese have promised (if the emperor will agree to it) to leave a couple of rich islands to the English, to admit their ships to five principal ports, to pay them twenty-one million dollars (about five millions sterling,) six millions in hand, and the rest within three years, besides many minor concessions. If the Chinese make the treaty in good faith, they are cowards—if in bad faith, both rogues and cowards. They should have submitted to pay England as much a pound for her poison as England liked in the first instance, if they did not mean to show more fight than they have done.

Poor China—big, feeble, bed-ridden old woman—why did it enter thy crazy night-capped head that thy 16,000 years of age, and thy 350 millions of people, who had never used sword or shillelagh, and have submitted to wear their hair in queues that policeman might more easily arrest them, or thy Confucius's Quaker religion, or thy washing-tub junks, or thy mandarian literature, or thy mother o'-pearl swords and crockery fortifications, could save thee from the first pirate, piratical enough to disregard thy respectable imbecility? How are thy crutch, and thy tissue bed robe, and satin coverlid torn away, and thy down bed pulled from under thee by barbarians. The villainy of England may excite our anger, but we cannot much pitty the Chinese, we despise them so much. Had they shown signs of manhood we would honor them and grieve for them. Brave men, lavish of blood, and fierce in fight for native land, have our sympathy in triumph or defeat: but for the poltroon and the imbecile, let him take care of himself. Let him sink unless he has the spirit to swim.—*The Nation.*

RUTHVEN'S HYDRAULIC STEAMER.

On Saturday Mr. Lees gave another exposition of the principles on which Mr. Ruthven purposes to propel a steam vessel. After adverting to the disadvantages of the paddle-wheel, that his audience would readily understand Mr. Ruthven's plan by the following illustration. He than pointed their attention to a tube which was hanging vertically, and which was filled with water. Here he said there was no motion, because the opposite surfaces were pressed with the same force; upon removing one of these, however, the tube was immediately seen to reflect to the opposite side from that where the water issued, and thus of course manifesting the pressure to which it was exposed. The lecturer than illustrated the motion which might be produced in such a case by a small model of Barker's mill. Now, Mr. Ruthven's principle was virtually the same. He employed steam to throw out jets of water at the sides of the vessel in the direction from stem to stern, and thus effected the progressive motion of the vessel. The various properties given in our last report were then illustrated by the model in succession, such as backing, stopping, turning, &c., all of which were performed without any change in the movements of the engine. Mr. Lees than said, that one immense advantage of the Ruthven steamer over the paddle-wheel vessel would be this, that the action of sails in the former would in no degree lesson the action of the engine, while in the latter they did take from the effect of the engine to a great extent. In the latter case, when sails were used, the paddles, to be of any use had to revolve faster, which of course entailed a greater expense of steam, and hence what was gained by the wind was lost in fuel.

He concluded by observing, as before, that the principle of the motion was sound, that the illustration by the model was all that could fairly be expected, and that in short, the matter was eminently deserving of being tested on a large scale. This, we have reason to know, is shortly to be accomplished.

The lecture was attended by a great number of scientific gentlemen, many of whom came forward at the conclusion, and expressed their concurrence in what had been stated on the merits of the invention.

ALBANY, SATURDAY, FEB. 4, 1843.

THE WORKING MAN'S MISCELLANY.

This is emphatically an age of cheap literature, and it is only to be regretted that so little of the useful is mingled with the flood that pours from the press. It is proposed to remedy this evil by publishing a cheap and neat form of such lectures, addresses, and compendious works, &c., &c., as may be deemed of value and interest. These it is proposed to issue occasionally, under the above title, so as to be sent by mail at periodical postage. If the plan is supported by the laboring public, the best productions of the best pens will thus be placed in every man's hands at the most trifling cost.

The first of the series, a Lecture on "*the Condition and True Interests of the Laboring Classes*," by E. G. SQUIER, is now ready, in a neat pamphlet of 16 pages double columns, and elegant cover. Single numbers 6 cents, to be obtained at this office.

☞ 20 copies sent by mail to any part of the state for $1; 100 copies for $4. The mechanic associations and clubs of mechanics cannot do better than give this lecture a general circulation. The next in the series will be *Channing's Lectures to the Laboring Classes*, of which due notice will be given.

☞ All orders, accompanied by the cash, (*post paid,*) addressed to the publishers of the Mechanic, will be promptly attended to.

THE PIANO FORTE.

A paragraph is going the rounds of the papers, ascribing the invention of the piano forte to Zumphi (Zumpe ?) a German artist, living in London, about the year 1718. Our own memory goeth not so far back as the origin of the piano forte, but we find its invention attributed, on very good authority to Viator, a German mechanic, who took his first notion of it from the clavichord; and that the invention was followed up by other musical instrument makers of the same nation, who all left their clavichords and harpsichords for the new instrument, and among them the name of Zumpe is mentioned. This was the *square piano forte*. The *grand piano forte* is supposed to be of earlier date, and is said to have been the invention of a German musician of the name of Schroeder, or, as others say, of Christophali, a harpsichord maker of Padua. The first manufacturer known in England was a German of the name of Backers, with whom Zumpe was contemporary. Zumpe realized an ample fortune and retired. Having set this knotty question right, we cannot omit to add in conclusion, that the sweet toned instruments of Messrs. Boardman & Gray, of this city, are brought to such perfection, as good old Zumpe never dreamed of in his quiet retreat.

CARPET TAPESTRY.

By the last No. of the *Civil Engineer and Architects Journal*, we learn that at a meeting of the British association for the advancement of science, some specimens of newly invented carpet tapestry were exhibited by Prof. Vignoles, who explained that these works were made on the principle of the ancient mosaics, being composed of innumerable transverse sections of woollen threads, without the use of painting or coloring; all the effect being produced by ends of worsted about one eight of an inch long standing vertically, one end being seen, and the other cemented by India rubber to a cloth. The exact operation was yet a secret, but he believed that two frames of fine wire or perforated zinc (some with even 4000 perforations in an inch) were placed over each other exactly vertically, the distance being only regulated by the height of the room, in the present instance he believed about five feet. The picture to be copied being then traced on the top side of the upper frame, a workman passed threads of dyed wool through the correspondig holes in the top and bottom frames, of course, as in tapestry, varying his shades and colours until he is satisfied with the effect; this he can judge of by looking down on the upper ends of the threads, although to a person looking at the space between the frames, there seems only a confused and compact mass of worsted. When the workman is satisfied, the upper ends of the threads are covered with India rubber cement, and a cloth is laid upon them also covered with cement; the ends of the threads firmly adhere to this cloth. By means of sharp cutting instrument, the entire mass of threads is now cut through transversely at about one eight af an inch from the cloth, and this process being repeated, a fresh copy is obtained from every one-eighth of an inch; in the present frames, being five feet apart, 480 copies can be cut, and as there is no limit to the distance; except the height of the apartment, thousands of copies may be taken of each. Were this not the case, the invention, however ingenious, would he too expensive to be purchased except in solitary instances as specimens of art: but, from the facility of reproduction, this fabric was likely to come into general use for carpets, rugs, curtains, table and chair covers, &c.; for carpets and rugs it could be made with a longer nap, so as to give any degree of substance.

STRIKES AND TURN-OUTS.

In those wars between the employer and the employed, called *strikes* and *turn-outs*, the costs and consequences fall heavily upon both parties. They generally arise from an attempt of the former to reduce the wages of the latter; and when followed by a strike, the employer not unfrequently suffers in his business or by the destruction of his property to an amount greater than he would have gained if his point had been peaceably carried. On the workmen also the consequences are equally disastrous. They are liable to lose more, pecuniarily, than if they yield the point. But they are impelled by motives of principle rather than profit, or by both. A foreign correspondent of the *Journal of Commerce*, alluding to this subject says:

"From a calculation made, it appears that the operatives have expended, during the last five years, the following sums to support those who have "stood out," and refused to work, except upon their own terms. The Glasgow cotton spinners, £47,000; and Manchester cotton spinners, £370,000; and the wool combers, £400,000; Leeds mechanics, £187,000. The late strike is not included in the above, but is supposed to cover as much as all these sums put together. In Stockport alone, it is estimated that as the "turn-outs" now receive £9,000 weekly in wages, the five weeks of the "strike" loss to them is £45,000. The loss to the staple trade of the town is believed to have been £30,000, and to the different shokeepers and various town traffic, £15,000, making in all the enormous sum of £75,000 entirely lost to the borough for ever. To this must be added the extra expense incured by the authorities to restore and maintain tranquility: 7,600,000 pounds less of cotton wool has been consumed, and of course a corresponding amount less of cloth has been manufactured!

Another result of this "turn-out" has been generally to create an arrear of work, and to cause a demand for goods. Iron has gone up in price in consequence, and the manufacturers have got rid of their old stock. Thus far it has done well, and shows that there is no evil without its accompanying good.

MR. COOK'S REPORT.

This long-expected report we this week present to our readers, in full, and would commend it to their attention, not only from its interest as relating to the prison question, but as containing also much valuable and interesting information. It will be seen that it is decidedly favorable to the plan contemplated in the bill of last winter, and endorsed by the State Convention of Mechanics; and under the circumstances we can see no reason why our Legislature should not give this subject for once a careful and dispassionate examination. The criminal hypocricy which has characterized the movements of the legislature and officers of the state on this matter, in years past, we hope will not be kept up, in any future action that may take place. This is no idle charge, this charge of hypocricy, for facts have come to light which show conclusively, that laws have been framed with the understanding that they should never be enforced; that committees have been appointed to make reports apparently without the remotest intention of acting upon them, and that commissioners have been selected, and a mere nominal time allotted them for examination, with the—for once disappointed—expectation of their making an unfavorable report, and all this merely to silence the complaints of the mechanics, forsooth, as if, like children, the hard-handed laborers of our state were crying for they knew not what! Out upon such undignified, such detestable trifling, such contemptible jugglery!

Thus with regard to the report before us—a whole month's time was magnanimously allowed the commissioner, at the enormous sum of $3 per diem—total 90!—in which to examine the mining districts, the prisons, &c., and report on the practicability, &c. &c., of employing the convicts therein. That is to say, if he stayed at home, as was advised by some, or went on a fishing excursion to the wilderness, as recommended by others, and made a report, so that it was *unfavorable*, there was time enough; and if, on the contrary, should the commissioner be tempted to examine for himself, lest he might do the subject justice, and report favorably, it was deemed a capital stroke of policy to cut short the time and thus have him kill the plan by saying—"not knowing cannot tell."

Rare policy that; most honorable, most worthy rogues! Disinterested advice truly! But in this instance, they had mistaken their man, and provoked a more attentive examination; which, like

attentive examinations, resulted in convincing the commissioner, against his preconceived prejudices, of the wrong done to the mechanical portion of the community, at the same time that his observation convinced him of the practicability of employing the convicts with safety and advantage, as recommended by the mechanics generally, in our northern mines. On this point the report will speak for itself.

Mr. Cook deserves the thanks of the mechanics for the noble manner in which he has discharged his duties, spending treble the time allotted, and at his individual expense, in prosecuting his inquiries. It would be but simple justice for the state to reimburse the sum thus expended.

A WORD TO MECHANICS.

The report of Mr. Cook is now before you. Of the plan, the only one which ever offered more than the semblance of relief, you are yourselves the judges. It is now for you to act, energetically, efficiently. Never before has so favorable an opportunity offered, and with one strong effort the long sought object will be obtained. Let immediate action be had in every quarter, and let the results come before our legislature in a proper manner. No time is to be lost.

INGENIOUS CLOCK.—Innumerable curious mechanical contrivances have been made in the name of clocks. We have given accounts of several, which for their ingenuity deserve to be remembered, though their inventions were long since forgotten. Evelyn, the English antiquary, gives an account of one in his *Diary*, which was presented to Charles I, by a German prince, and was valued at £200. It may be remarked that most of these clocks were constructed by Germans. Under date of Feb. 24, 1655, Evelyn says:—I was shewed a clock, whose balance was only a crystal ball, sliding on parallel irons, without being at all fixed, but rolling from stage to stage, till falling on a spring concealed from sight, it was thrown up to the utmost channel again, made with an imperceptible declivity; in this continued vicissitude of motion, prettily entertaining the edge every half minute, and the next half, giving progress to the hand, so as in 120 half minutes, or periods of the bullets falling on the ejaculatory spring, the clock part struck." An amusing specimen of this kind of work, has been observed for some time by the passers at the window of Mr. Fellows, in Market street.

SELF MADE MEN.—Some time since the editor of the *Rochester Daily Advertiser* took us to task for publishing a list of *self made* shoemakers, alledging that such articles were forbidden by the principles of Christianity, because they had a tendency to render labor disreputable! We are glad to see that the editor has changed his views on this point, or the paper has changed editors; for in a late number we find the following article, having for its object the same purpose with our own, which met so very modest a rebuff.

Wm. Allen, says the Lynchburg Republican, the present distinguished and talented Senator from Ohio, was, some twenty years ago, an apprentice to the saddler's business in this place. Some of our citizens who knew him when he resided in Lynchburg, says that he devoted his leisure hours, during his apprenticeship, to the improvement of his mind; and that his friends then predicted that he would at some day rank among the first men of the nation. Their flattering anticipations have already been realized, and it is believed that the measure of his fame is not yet full. What an example to the indigent youth of this country! The poor saddler boy, by self exertion, raised to the highest place among the Legislators of his country!

NEW MILL WHEELS.—A gentleman of Bangor, Me., Samuel L. Valentine, who has been for several years engaged in improving mill wheels, has invented two new water wheels, for which he has obtained patents. We have seen no description of the mode of the construction and operation, but they are highly commended by the editor of the *Bangor Courier*, who takes an interest in such matters.

DISCOVERY OF COAL IN NEW YORK.

So frequently is it announced that coal has been discovered, in this state, that we are constrained to notice the fact for the purpose of comment.

Observations in all quarters of the globe, by men of experience and knowledge, have proved that no workable coal beds were deposited until a certain period. Small masses of anthracite, however, do occur in the oldest of the sedementary rocks. Sometimes it is disseminated in small particles, in others it is collected in masses from the size of a walnut up to that of a goose egg, and perhaps, in a few instances, larger. These masses are perfectly insulated, in cavities. As we approach the true coal bearing rocks we begin to discover it in their seams, continuous over several square yards. All indications of coal, however, which are confined to such occurrences are always fallacious. In addition to these, we find many shale slates and limestones highly charged with bituminous matter, or with sulphuret of iron, which, when thrown upon a fire, present some feeble marks of combustion. But individuals often suffer themselves to be deceived, even in the absence of all the above phenomena. Thus, in the Lorrain slabs and Hudson river rocks, there is a glazed shining slate, which has been mistaken for coal in numerous instances.

We have one remark to make here, viz: that people in general show an unaccountable ignorance of what constitutes the true characteristics of things. There is a defect in their education and training which manifests itself in those every day occurrences where they are called to distinguish two things in which there are some slight resemblances.

But to return, coal beds are uniformly and without exception indicated by the presence of fossil plants, which resemble the preservation of common ferns; these, with stems and sometimes trunks of trees, mineralized more or less perfectly, constitute the true indications of coal. Coal, however, is not regularly present when these vegetable fossils actually occur, but there are no coal beds of any value where they are absent. We are then furnished with marks and signs of undoubted character of this important production, and hence there is no necessity of being deceived in this matter. We may profitably enumerate here the New York rocks.

1. The Potsdam Sandstone, a rock mostly silecious. 2. Calciferous sand rock, in which we have a gradation of a siliceous mass to one which is calcareous. Fossils are comparatively rare in these lower rocks. 3, 4, 5, are pure limestone, viz: Birdseye, Isle La Mott marble, and Trenton limestone, all of which are dark colored, except some varieties of the Birdseye. Succeeding the above rocks are slates or shales, most of which are dark colored; there are some brown and bright red slates in the two rocks which form this great and important mass. It is composed of the Utica slate and Hudson river shales, though the lattter mass has also been called Pulaski and Lorrain shales. There is no difference in these masses, except upon the Hudson river they are always distributed and broken, while in Jefferson co. they are uniformly even bedded and rarely lifted up into an inclined position. These are the masses in which coal hunters have been so successful in their supposed discoveries of this substance. It is only a few days since we heard of a man wending his way from New York to take possession of a bed of coal said to have been recently discovered near Coeymans. The probability is, that some one in digging a well has perforated the stratum of glazed slate which belongs to the Hudson river series. Strong complaints were made to Gov. Seward last summer that the geologists had neglected to explore a coal bed somewhere near Poughkeepsie, and, in proof of the existence of the article, the owner forwarded a neat little box of the supposed treasure to his Excellency, which, on being opened, was found to contain nice *specimens of glazed slate*.

(To be continued.)

IRON.

In the last No. of the Mechanic there appear two articles over the respective signatures of E, and B, in relation to the subject considered in an article of mine in the No. of the 21st ult.—one coinciding, the other disagreeing with me in all particulars. This diversity of opinion was not wholly unexpected.

The commucication of E, strengthens the position I have assumed, by a train of reasoning which shows its writer to be well versed, both practically and theoretically, in the manufacture and properties of iron, and increases my confidence in the opinion which I have already formed. In the conclusion of the article, reference is made to the Geological Report of the Second District, as treating of this subject at length. I have had the pleasure of perusing all that relates to Iron in that report, and am greatly indebted to its distinguished author for much valuable information derived from it. Although, from some quarters, there is and always has been, opposition to the geological survey of the state, there can be no doubt that the advantages which have already, and will result from it, will cause the people never to regret the expenditure necessary to its prosecution and completion.

In the article signed B, the writer appears to differ with me entirely, and would appear to insinuate that I do not understand the process of making iron. Of that I must be judged by my manner of treating the subject. I am much puzzled to understand some of his assertions; for instance, he states: "In making No. 3 pig iron, the furnace is run high (a term used by founders) and the casting matter and flux are thrown off, and it *readily receives a great proportion of carbon from the chloride.*" We are at a loss to know how carbon is received from *chloride*, in the process above spok-

en of; and, unless this is a typographical error, it proves a lamentable ignorance in that of which it would please the writer to insinuate a want of knowledge in me. His argument that I might as well prove that a bar of soft malleable iron contained more carbon before it was converted into steel than it does afterwards, is entirely fallacious. I do not pretend to assert that pure malleable iron has any carbon, for it is well known that it is the very absence of carbon which gives it its malleability and purity. But what we do assert is this, *that carbon united with iron in certain proportions gives it a particular character, and when increased beyond those proportions, the character of the iron is entirely changed, and it becomes the reverse of what it was before.* In chemistry this is ascertained to be the fact with various bodies. For instance, steel, which is much harder than malleable iron, is formed by combining the latter with carbon, in certain proportions. Now, if the proportion of carbon is increased the character of the metal is changed, and it approaches to that of soft pig iron; and if the proportion of carbon is still farther increased, the result is plumbago, which is much softer than iron. This certainly appears contradictory, but such is the fact. The effect is well known, but the particular cause is yet doubtful. In my mind it may be accounted for in this way: carbon unites readily with iron in certain proportions, and produces certain effects, but on changing those proportions by increasing that of the carbon, the affinity of the two bodies is destroyed, and the carbon remains in the metal diffused and uncombined. This is a theory without any experiments for its foundation, and therefore it is put forth merely as a suggestion. We do not see but that B's argument in relation to No. 3 pig iron losing its carbon so readily, when exposed to the action of the oxygen of the blast in a forge-fire tends to substantiate my doctrine that No. 3 has less carbon than No. 1; for certainly that which has the least carbon is the most readily reduced.

It is hoped this matter may be fully discussed, as it cannot fail to produce good. The subject is important in its practical bearings, and interesting in a scientific point of view—let practical and scientific men unite in settling this mooted point.

T.

☞ We have been compelled to omit from week to week a great number of articles already in type, and among them some valuable communications. The great length of the report of Mr. Cook prevents the usual variety, but its importance will compensate for all that. Our news articlas are also occasionally a little out of date, from the same cause, that of being crowded out for another week.

INTELLIGENCE.

PREMIUMS.—At the late anniversay of the agricultural society in this city, the following premiums were awarded:

For the premium on the best plan of a farm house, barn, and necessary out-buildings, three plans were presented. The premium was awarded to John J. Thomas, of Macedon, Wayne county—gold medal.

The premium for the best specimen of Floral Painting, was awarded to E Whitfield, Albany—silver medal.

The premiun for engraving the best specimen of potraits of domestic animals, on wood, was awarded to John W. Orr, of Albany—gold medal.

Six hundred pounds of sugar, have been obtained from one acre of *corn stalks*, the past season, in Indiana.

The journeymen tailors of Philadelphia and county assembled at the Assembly Buildings on Monday. Their present object is not a premeditated "strike," but is called with the intention of laying before their employers, in respectful terms, the subject of their wages, which they declared inadequate for their support, and totally disproportioned to the present rate of the trade sale.

The Diet at Frankfort promised Wagner—who claimed to have successfully devised the employment of electro-magnetism in the movement of machinery—one hundred thousand florins in case his appuratus should be found equal to its representation. He has reported that he has surmounted every difficulty.

The number of hands employed on the Erie Canal is upwards of 30,000; of these 5,000 are boys employed as drivers of horses, 3,000 of whom are orphans and in a most deplorable state of mental and moal degradation.

A Bombay paper, quoting a report that the American cotton crop this year would be 2,500,000 bales, adds,—"To give an idea of this immense quantity it is only necessary to state, that to put one bale at the end of another would encircle the whole island of Great Britain, or wall it round three feet high and two feet thick!!! so that there will be no *scarcity* of the RAW MATERIAL."

A philanthropist in London investigated the situation of the workwomen who were engaged in shirt making, and found that they received for making a shirt only one penny, and that out of this sum they were obliged to find thread, which reduced the sum to about three farthings. Their sufferings, of course, were very severe.

It appears that the attempt to raise cotton on Bengal has proved a failure, in consequence of the hot winds and bad climate.

La Presse calculates that in England, the annual expense of a soldier is 540f; in France, 340f; in Prussia, 213f; in Austra, 240; and in Russia, 120f.

On opening a vase lately discovered in the ruins of Herculaneum, the learned Abbe Facciolati found an orange in vinegar. It appeared the Romans pickled oranges as we do gherkins. This pickle has been preserved for 1,700 years.

BUSINESS NOTICES.

☞ All letters and communications intended for this paper should be *post paid to secure attention*.

Terms for vol. 2.—To clubs of 20 or more, having the paper sent in one package, $1 each per annum, in advance.
To clubs of not less than 5, sent as above, $1.25 each, in advance.
Single subscribers $1.50, in advance.
Members of the state and county or town associations, subscribing through the secretary, are entitled to the paper at $1 per annum, in advance.
All papers discontinued at the expiration of the time paid for, unless previously renewed.

BINDING.—Subscribers wanting their volumes bound, can have them done in any style and at reasonable prices, by leaving them at this office.

☞ DAVID THOMAS BISBEE, whose transactions as agent for this paper and some others are sufficiently notorious, we understand is located in Syracuse. The public are cautioned against having any transactions with him for this paper.

Wood Engraving and Designing.

E. FORBES is prepared to attend to all business of the above description at the *Sculpture Rooms* 17 Stanwix Hall.

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WOOD ENGRAVING.

N. ORR, (late pupil to J. H. Hall,) is now prepared to execute any orders in the above business, which he may be favored with, and respectfully solicits a share of patronage.

Room No. 6, 3d floor, Exchange.

Having made arrangements with Mr. N. Orr, to do my wood engraving, I recommend him to the public as one who understands his business and will doubtless give satisfaction.

JOHN H. HALL.

Albany, Feb. 4th, 1843.

LEATHER, OIL, AND FINDING STORE,

No. 18 Hudson Street.

J. HOCHSTRASSER,

Willcontinue the above business at his old stand, and having madearrangements with manufacturers of Leather and Morocco in the cities of NEW-YORK, PHILADELPHIA, and ALBANY, and having in his employ first rate workmen, he is enabled to supply his customers with all the articles in his line on the most reasonable terms, at *Wholesale* or *Retail*, the following are included in his assortment: Oak and Hemlock Harness, Bridle, Collar, Horse, Trunk, Valise and Skirting Leather; Hog Skins, Philadelphia Russet Bridle, do. Facing Skins, do. Lining Hides, do. Top Hides, Patent Leather, Coach Roans, Neats Foot and Liver Oil, Currier's Tools, Oak Sole Leather, Hemlock do., Wax and Grain Upper Leather, do. Calf Skins, Keez's Philadelphia do., Seal and Kip Skins, Splits and Wealt Leather, Cordovan, Red, Green, White and Yellow Linings, Goat and Sheep Binding Skins, White Alum Dressed Linings, Dressed and Undressed Morocco, Colored Goat and Sheep Skins, English Shoe Thread of all numbers, India Rubber and Patent Cloth, Apron Skins, Stock Binding, &c.

N. B. An assortment of SHOE MAKER'S FINDINGS will be kept on hand.

Also, *Roller Skins, Engine Hose, Band, Picker, String*, and *Patent Leather*, on hand and made to order. *Albany*, 1841.

To Cabinet-Makers and Upholsterers.

DANIEL FRY, No. 40 State street, *Importer of Cutlery and Hardware*, keeps constantly on hand a good assortment of HAIR SEATING and CURLED HAIR, together with a complete assortment of *Cabinet Makers' Hardware*, which is offered for sale law for cash or approved credit.

FIRE ENGINES!!

THE subscribers are manufacturing at Waterford, on an extensive scale, Fire Engines of various patterns, to suit purchasers, and they do not hesitate to recommend their Engines as decidedly superior to any now in use.

They manufacture the common Piston Engine, to work with chains or connecting rods, which they have improved in the construction of the brakes and the application of the power, so as to give them a decided advantage over those now in use. They also manufacture Rogers' Patent Balance Fire Engine, which has always been proved to be of *superior* power to all others.

Prices at the Factory, in complete order for use:

Those designed					
For 40 men, largest Philadelphia size or 11 inch chambers,					$950
" 28 "	"	Albany	"	8 1-4	" 700
" 22 "	"	Common	"	7	" 600
" 16 "	"	N. York city	"	6 1-2	" 525
" 12 "	"	Small		5 1-2	" 450

These prices are one hundred dollars below what engines have formerly been sold for, but they are reduced to suit the times.

The above prices can be reduced $50, by dispensing with the tower and goose neck and passing the water through the forward end of the machine. The *utility* of such an engine is fully equal to any other form, but its appearance is not quite so good. They also manufacture Factory Engines and Forcing Pumps of all sizes; Suction and Leading Hose to order, both rivetted and sewed, of the best quality.

They have been in the business 8 years, and might furnish many testimonials of good workmanship, &c., but as purchasers are supposed to prefer judging for themselves, the subscribers will furnish an engine where desired, and if on trial it is not fully equal in *all* respects to the *best* engines now in use, they will take it awey without charge. Having an unlimited water power situated at the head of sloop navigation on the Hudson river, and near the junction of the Champlain and Erie canal, with a rail road connecting east with Boston and west with Buffalo, our facilities and arrangements for manufacturing are such that orders can be filled at any season of the year, and with the greatest promptness and despatch at the lowest rates.

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Waterford, Saratoga Co., N.Y.

MISCELLANY.

A LAY OF THE OLDEN TIME.

The warrior came from the tented field,
In the pride of his young renown,
He hung on the bough his tattered shield,
And flung his helmet down:
His dinted sword was cast aside,
And he loosed his steel-linked vest,
And gazed a while with a warrior's pride
On the scars that marked his breast.

"Farewell my sword," said the warrior then,
"Thou hast served me well and long
In the strife of lion-hearted men,
In the fierce and mingled throng;
And where thy blade hath flashed on high,
Red blood hath flowed like wine,
On the sunny fields of Italy,
And the plains of Palestine.

Bright summer came, and the Sun God's eye
Look's down on a quiet spot,
And silvered the streams that murmured by,
A sweet vine-covered cot,
That cot was the home of love and joy—
There the warrior clasped his bride,
And the father gazed on his fair-haired boy
With all a father's pride.

Still hangs his shield on the olden bough,
And his casque is flung beneath,
And he tastes a purer pleasure now
Than he found in the field of death.
A prattling child and a happy wife,
Beguile the soldier's cares—
No more he pants far the bloody strife,
His love—his heart is theirs.

A WONDER OF PATIENT TOIL.—An Italian artist, Signor Adrea Cambassini, is now exhibiting in London, a model of St. Peter's at Rome, on a grand scale, showing both the interior and exterior of that wonderful edifice to the nicest degree of accuracy. It is on the scale of one to a hundred, between twenty-one feet in length and six feet four inches in height. The Signor was engaged fourteen years in its construction.

The exterior of the model is of itself a surprising effort of ingenuity; it is consructed of maple, and is admirably regarded as a piece of joinery merely: the architectural forms are sharply defined, the columns and capitals accurately cut, and the statues delicately carved in ivory. The model is made to open, like a cabinet, to show the interior; being divided down the centre, one side is detached from the other; and the visiter is thus enabled to form a conception of the surpassing splendor and richness of the *coup d'œil*, and to examine in detail the plan of the structure and its decorations. The gray marble columns, the inlaid floor, the gilded ceiling, the painted dome, and walls enriched with the treasures of painting and sculpture, are exposed to view; the east end and the transepts also open and by means of a mirror every recess of the chapels become visible The mosaic pavement is composed of various woods resembling colored marbles, but the marble pannellings of the walls are painted by hand; the statues are carved in ivory, and the mosaic altar-pieces and pictures of the dome and ceiling are executed on copper in the most finished style of miniature-painting; not a statue is omitted, not a slab of marble but is faithfully represented.—*Com. Adv.*

FEMALE SLAVERY.—In one parish in the suburbs of London alone, it was ascertained at a public meeting held on Tuesday week, that there are thousands of women employed in shirting who must work fourteen hours to earn 6d—who are actually paid at the rate of five farthings for making a shirt—who are thus reduced in hundreds of instances to premature graves—and who either pine away in helpless and emaciated wretchedness—or derive from the horrors of prostitution a miserable means of adding to their resources. Shame, shame, upon Christian England; You care for the blacks; show your sympathy for the enslaved whites. Why send your useless help to the negroes of central Africa, when in the center of England we have so fearful a mass of pining want, and woe, and degradation, and misery?

The *Sentinelle des Pyrennees*, states that on the night of the 20th ult., 275 dozen of larks, larks, which were on their way to escape from the cold, and seek in Africa a more congenial temperature, precipitated themselves on the open fire of the lighthouse at Biareite, and perished.

Almanac for February.

First Qr. 7th day, 11h. 2m. morn
Full moon 14th day, 3h. 2m. aft.
Last Qr. 21st day, 5h. 4m. morn.

D's Mo	D's Wk	Sun rise.	Sun sets.	Len. days.	Equa. time.	Moon r. & s.	Moon south.	
1	We	7 7	4 53	9 46	*add.*	*sets.*	1 32	♓
2	Th	7 6	4 54	9 48	14 1	8 31	2 13	
3	Fri	7 5	4 55	9 50	14 8	9 30	2 53	
4	Sat	7 3	4 57	9 54	14 14	10 30	3 34	♈
5	*A*	7 2	4 58	9 56	14 19	11 31	4 16	
6	Mo	7 1	4 59	9 58	14 24	*morn.*	5 1	♉
7	Tu	6 59	5 1	10 2	14 27	0 34	5 49	
8	We	6 58	5 2	10 4	14 30	1 36	6 39	
9	Th	6 57	5 3	10 6	14 32	2 37	7 34	♊
10	Fri	6 55	5 5	10 10	14 33	3 34	8 30	
11	Sat	6 54	5 6	10 12	14 34	4 25	9 23	♋
12	*A*	6 53	5 7	10 14	14 34	5 10	10 25	
13	Mo	6 51	5 9	10 18	14 32	5 47	11 20	♌
14	Tu	6 50	5 10	10 20	14 31	*rises.*	*morn.*	
15	We	6 49	5 11	10 22	14 23	6 47	0 15	
16	Th	6 47	5 13	10 26	14 25	8 5	1 9	♍
17	Fri	6 46	5 14	10 28	14 21	9 21	2 1	
18	Sat	6 44	5 16	10 32	14 16	10 39	2 54	
19	*A*	6 43	5 17	10 34	14 10	11 55	3 48	♎
20	Mo	6 42	5 18	10 36	14 4	*morn.*	4 45	
21	Tu	6 40	5 20	10 40	13 57	1 5	5 41	
22	We	6 39	5 21	10 42	13 50	2 5	6 38	♐
23	Th	6 37	5 23	10 46	13 42	3 1	7 34	
24	Fri	6 36	5 24	10 48	13 33	3 45	8 27	
25	Sat	6 34	5 26	10 52	13 24	4 25	9 18	♑
26	*A*	6 33	5 27	10 54	13 15	4 56	10 5	
27	Mo	6 32	5 28	10 56	13 4	5 27	10 50	♒
28	Tu	6 30	5 30	11 0	12 53	5 47	11 31	♓

A DARING AND NOVEL NAVIGATOR.—The Semaphore, of Marseilles, gives an account of the arrival in that port of a bold and ingenious sailor, who has constructed a boat formed to fit his own body, when laid at full lenghth, in which he traverses the sea with a swiftness and security rivalling that of fishes. His head and arms alone appear from without, and with the latter, holding a pair of oars, he impels himself along. Provisions are stored in the recesses of the boat, and thus he made a voyage from Toulon to Nice and Leghorn, coming to Marseilles by the Island of Hyeres. On arriving in port he complied with all the prescribed regulations, entering his own name, Malbec, and that of his vessel, and then darted across the harbor like an arrow. On being examined when on shore, the wonderful vessel was found to be a piece of perfect mechanism. It is furnished with a small pump, similar to that used in wine and beer houses for drawing the liquor from the casks in the cellar, and by means of which any water the boat may make can be easily discharged. Having been deprived of his leg, M. Malbec has converted its wooden substitute into a mast, upon which he occasionally raises a sail suited for his light bark, and which he can trim with ease, according to the wind and the course he wishes to steer. M. Malbeb's visit to Marseilles is said to be for the purpose of having a vessel on his own plan constructed of cast iron, with various improvements, among which are to be hollow masts admitting air into the body of the boat, so that either in foul weather or fair, when requiring sleep, he may lie down on the matress at the bottom, close the aperture and hatchway for his head and arms without fear of being suffocated. He has given his vessel the appropriate name of the Duck.

APPETITE—A relish bestowed upon the poorer clases, that they may like what they eat, while it is seldom enjoyed by the rich, because they may eat what they like.

PATENT AGENCY AND MECHANICAL ENGINEERING, *Office on F street, between 7th and 8th streets, opposite the Patent Office, Washington City, D. C.*—The subscriber has resigned his situation in the patent office (where he for some time superintended the restoration of patents destroyed by fire in 1836) to devote himself to the preparation of specifications and drawings, and all matters connected with the obtaining of patents for useful inventions either in this country or Europe. His experience in theoretical and practical mechanics, together with an intimate knowledge of the progress of the useful arts and manufactures, at home and abroad, will enable him to judge of the novelty and utility of inventions submitted to his examination; and as patents are not granted, under the existing patent laws, when the alleged inventions are wanting in novelty, or contravene the established laws of science, he will be able to furnish all the information necessary to avoid the expense of making application for patents which could not be granted.

Having established a foreign correspondence, he will be able to secure patents in Great Britain, France, and other parts of the continent, or furnish information, and prepare all the necessary papers for that purpose.

A model for a machine or apparatus, or specimens for a composition of matter, are required by law, before a patent can issue; by sending a model or specimens to the subscriber, with a short statement of the object of the invention, the necessary papers and drawings will be prepared and forwarded to the applicant for execution, thereby obviating the expenses consequent upon a journey to Washington, or delay in issuing the patent.

Being well acquainted with the patent laws of the United States, England and France, and the decisions of the courts in patent cases, he tenders his services where information is required in reference to infringements of patents, or defence against suits for infringement, such as compiling and arranging evidence, &c.

To individuals and companies wishing to procure drawings and estimates of machinery, or buildings, for manufactories, on the most modern and improved plans, or any other matter connected with mechanical engineering, he will furnish information; and, should it be required, will locate and superintend structures of this description.

Wishing to be generally useful to mechanics and inventors, he will attend to the sale of machinery and patent rights; this, being a place of resort from all parts of the Union, is perhaps the best location for such a purpose.

Papers relating to patents can be sent to the commissioner of patents, when voluminous, free of postage, and models sent to the collectors of the principal ports, will also come free of expense, and the subscriber can be advised thereof by letter, which in all cases must be post paid All applications for information relating to patents must be accompanied by a fee of five dollars; charges for other business transactions will be made according to their magnitude. J. JAMES GREENOUGH.

Certificate of HON. H. L. ELLSWORTH, *Commissioner of Patents.*
PATENT OFFICE, Nov. 20th, 1842.

Mr. *J. J. Greenough*, who has for some years been employed in the patent office, in a highly responsible situation, under the act of 1836, restoring the records, having to my regret tendered his resignation, I take great pleasure in recommending him as a gentleman worthy of confidence, and as being particularly qualified to take charge of any business requiring a knowledge of mechanical science, the progress of the arts, and patent improvements. Mr. Greenough is also well acquainted with the practice of this office. HENRY L. ELLSWORTH.

REFERENCES.—Hon. S PRENTISS, of *Vt.*, U. S. Senate; Hon. J. P. Kennedy, of *Md.*, U. S. House of Reps.; Hon John C. Clark, of *N. Y.*, U. S. House of Reps.; Hon W. Cranch, *Chief Justice, D. C.*; J W. Hand, Esq., *Chief Clerk, Patent Office;* C. M. Keeler, Esq., *Examiner, Patent Office.*

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